Volunteer Lake Assessment Program Individual Lake Reports

PLEASANT LAKE, NEW LONDON, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	7,488	**Max. Depth (m):**	28.6	**Flushing Rate (yr^{1})**	0.7
Surface Area (Ac.):	606	**Mean Depth (m):**	10.5	**P Retention Coef:**	0.6
Shore Length (m):	7,200	**Volume (m^{3}):**	25,761,000	**Elevation (ft):**	805

TROPHIC CLASSIFICATION

Year	Trophic class
1979	OLIGOTROPHIC
1993	OLIGOTROPHIC

KNOWN EXOTIC SPECIES

The Waterbody Report Card tables are generated from the DRAFT 2014 305(b) report on the status of N.H. waters, and are based on data collected from 2004-2013. Detailed waterbody assessment and report card information can be found at www.des.nh.gov/organizations/divisions/water/wmb/swqa/index.htm

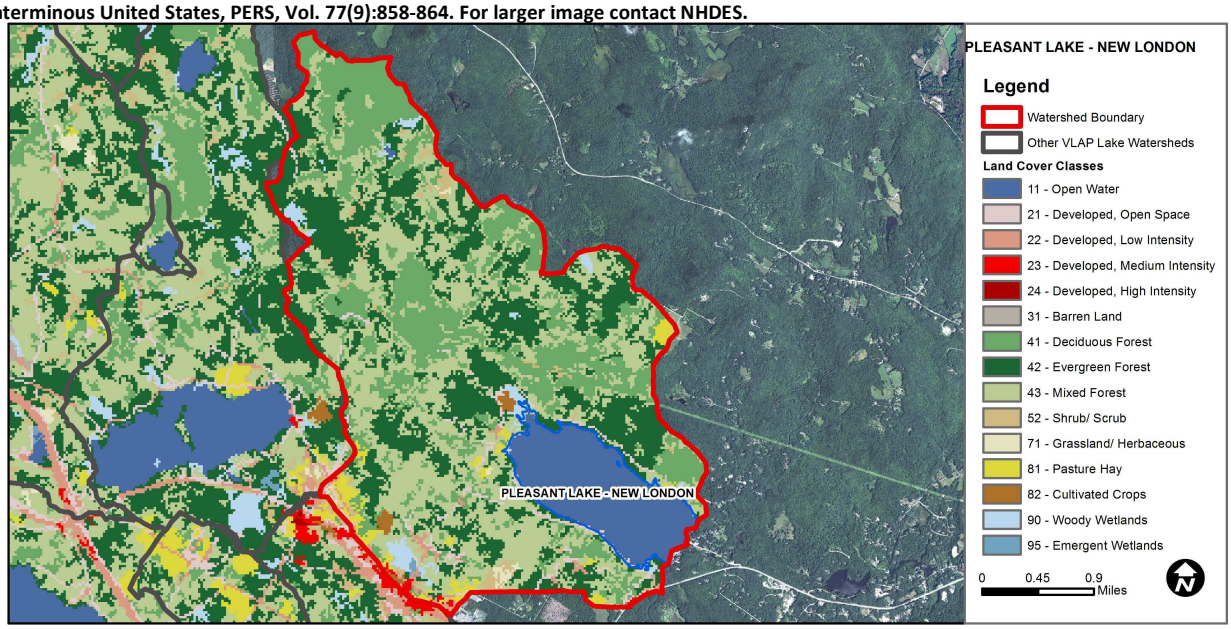
Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Good	The calculated median is from 5 or more samples and is < indicator and > 1/2 indicator and the chlorophyll a indicator is okay.
	pH	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	Oxygen, Dissolved	Bad	There are >10% of samples (minimum of 2), exceeding criteria with one or more samples considered large exceedance.
	Dissolved oxygen satura	Slightly Bad	There are >10% of samples (minimum of 2), exceeding criteria.
	Chlorophyll-a	Good	The calculated median is from 5 or more samples and is < indicator and > 1/2 indicator.
Primary Contact Recreation	Escherichia coli	No Data	No data for this parameter.
	Chlorophyll-a	Very Good	There are a total of at least 10 samples with 0 exceedances of indicator.

BEACH PRIMARY CONTACT ASSESSMENT STATUS

PLEASANT LAKE - ELKINS BEACH	Escherichia coli	Very Good	Where there are no geometric means, all bacteria samples are < 75% of the geometric mean. Where there are geometric means all single bacteria samples are < the SSMC and all geometric means are < geometric mean criteria.

WATERSHED LAND USE SUMMARY

Fry, J., Xian, G., Jin, S., Dewitz, J., Homer, C., Yang, L., Barnes, C., Herold, N., and Wickham, J., 2011. Completion of the 2006 National Land Cover Database for the Conterminous United States, PERS, Vol. 77(9):858-864. For larger image contact NHDES.



Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	9.6	Barren Land	0.02	Grassland/Herbaceous	0.29
Developed-Open Space	1.79	Deciduous Forest	22.5	Pasture Hay	1.91
Developed-Low Intensity	0.76	Evergreen Forest	26.98	Cultivated Crops	0.42
Developed-Medium Intensity	0.34	Mixed Forest	32.34	Woody Wetlands	1.49
Developed-High Intensity	0	Shrub-Scrub	1.5	Emergent Wetlands	0.09

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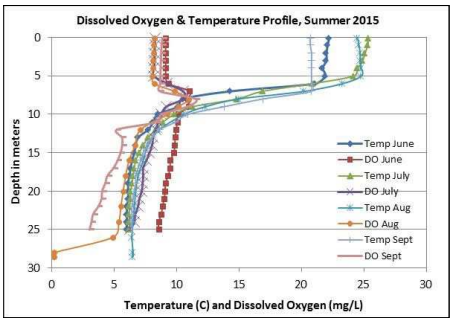
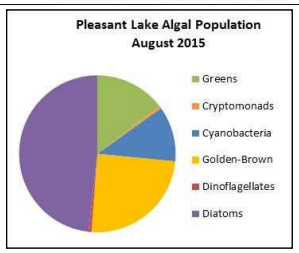
Pleasant Lake, New London
2015 Data Summary

- **Recommended Actions:** Water quality is good in the lake and representative of oligotrophic, or high quality water, conditions. A significant storm event and resulting stormwater runoff in June may have contributed to elevated phosphorus and turbidity in Chandler Brook and Turtle Cove. Stormwater runoff may also be contributing to the worsening transparency and highlights the importance of managing stormwater runoff from paved, dirt and gravel roads, driveways, rooftops, steep slopes, agricultural, and timber harvesting sites. DES has several resources available as well as the new Soak Up the Rain NH Program (www.soaknh.org). Work with local road agents to identify and manage stormwater runoff from roads and roadside ditches. Keep up the great work!

Observations (*Refer to Table 1 and Historical Deep Spot Data Graphics)*

- **Chlorophyll-a:** Chlorophyll levels were slightly elevated in June and decreased to low levels from July through September. Average chlorophyll levels decreased from 2014 and were less than the state median. Historical trend analysis indicates highly variable chlorophyll levels since monitoring began.
- **Conductivity/Chloride:** Deep spot, Chandler Bk., Outlet, Turtle Cove, and White Bk. conductivity levels were low and approximately equal to the state median. Historical trend analysis indicates stable epilimnetic (upper water layer) conductivity since monitoring began. Conductivity was slightly elevated at the upstream PL 4c station but decreased to low levels downstream at PL 4a. Conductivity was also elevated at upstream station PL 7d and decreased slightly at downstream stations PL 7c and 7a, and then decreased to low levels at PL 7. PL 5a conductivity was very low and PL 8 conductivity was average.
- **E. coli:** Turtle Cove E. coli levels were much less than the state standards for public beaches and surface waters.
- **Total Phosphorus:** Deep spot phosphorus levels remained within a low range from June through September. Average epilimnetic phosphorus decreased slightly from 2014 and was much less than the state median. Historical trend analysis indicates relatively stable epilimnetic phosphorus with moderate variability between years. Chandler Bk. and Turtle cove phosphorus levels were slightly elevated in June following a significant storm event. PL 7a-d phosphorus levels were slightly higher than other stations, yet were within a low to average range during spring sampling. PL 8 phosphorus levels were slightly above average in April.
- **Transparency:** June and August non-viewscope (NVS) transparencies were low due to wave conditions and significant storm events prior to sampling, however transparency in July and September was high (good). Average NVS transparency improved slightly from 2014 and was much better than the state median, however historical trend analysis indicates significantly decreasing (worsening) transparency since monitoring began. Transparency measured with the viewscope (VS) was generally better than NVS transparency and likely a better representation of actual conditions.
- **Turbidity:** Deep spot, Outlet, White Bk., PL 4c, PL 5a, PL 7, PL 7a, and PL 7d turbidities were low to average on each sampling event. Chandler Bk. and Turtle Cove turbidities were elevated in June following a significant storm event. PL 4a and 4b turbidity was slightly elevated in April, particularly at the upstream 4b station. PL 7c and PL 8 turbidities were also slightly elevated in April.
- **pH:** Epilimnetic and metalimnetic (middle water layer) pH levels fluctuated below the desirable range 6.5-8.0 units and hypolimnetic (lower water layer) pH was less than the desirable range. Historical trend analysis indicates relatively stable epilimnetic pH with moderate variability between years. Tributary pH levels were generally within the desirable range except for stations PL 4a, 4b and 5a.





Station Name	Table 1. 2015 Average Water Quality Data for PLEASANT LAKE									
	Alk. mg/l	Chlor-a ug/l	Chloride mg/l	Cond. uS/cm	E. Coli #/100ml	Total P ug/l	Trans. m		Turb. ntu	pH
							NVS	VS		
Epilimnion	5.3	2.08		47.0		4	6.64	7.64	0.50	6.56
Metalimnion				46.6		5			0.81	6.50
Hypolimnion				45.2		6			0.58	6.15
Chandler Brook				49.8		7			2.20	6.46
Outlet				46.4		4			0.48	6.66
Turtle Cove				45.2	10	8			0.80	6.68
White Brook				47.4		5			0.73	6.71

Station Name	Table 1. 2015 Average Water Quality for PLEASANT LAKE				
	Chloride mg/l	Cond. uS/cm	Total P ug/l	Turb. ntu	pH
Pl 4a		39.6	6	1.74	5.74
Pl4b		80.1	6	2.91	6.36
Pl4c		128.0	8	0.47	6.82
Pl 5a		18.0	5	0.67	5.82
Pl 7	8	48.3	4	0.66	6.75
Pl 7a		167.6	10	0.95	6.35
Pl7c		206.8	12	1.08	6.63
Pl7d		262.0	11	0.51	6.91
Pl 8	8	51.1	6	0.87	6.68

NH Water Quality Standards: Numeric criteria for specific parameters. Results exceeding criteria are considered a water quality violation.
Chloride: > 230 mg/L (chronic)
E. coli: > 88 cts/100 mL –public beach
E. coli: > 406 cts/100 mL –surface waters
Turbidity: > 10 NTU above natural level
pH: between 6.5-8.0 (unless naturally occurring)

NH Median Values: Median values for specific parameters generated from historic lake monitoring data.
Alkalinity: 4.9 mg/L
Chlorophyll-a: 4.58 mg/m^3
Conductivity: 40.0 uS/cm
Chloride: 4 mg/L
Total Phosphorus: 12 ug/L
Transparency: 3.2 m
pH: 6.6

Historical Water Quality Trend Analysis

Parameter	Trend	Explanation	Parameter	Trend	Explanation
Conductivity	Stable	Trend not significant; data show low variability.	Chlorophyll-a	Stable	Trend not significant; data highly variable.
pH (epilimnion)	Stable	Trend not significant; data moderately variable.	Transparency	Worsening	Data significantly decreasing.
			Phosphorus (epilimnion)	Stable	Trend not significant; data moderately variable.